

4th Nine Weeks Examination
Algebraic Connections
DO NOT WRITE ON THIS EXAM!

Use your own paper, and/or the computer, to report the answers to the questions. Make sure you use the problem numbers, show all work, document your solutions, and include the answer to the question! Name, Date, Period, and What it is.

1. During this examination, use at least **TWO** of the following technologies, in an effective attempt to solve two different questions below. Use Geometer's SketchPad, Excel, TI-Interactive!, Graphical Analysis, GroupWise, and/or Netscape Composer. Report the following information with your use:
 - a) what problem you were solving,
 - b) which of the technologies was used, and
 - c) why you think this was an effective use of the technology to solve the problem.
2. Collect data from your assigned car - as it moves toward the CBR (Motion Detector). Start with the car at a distance of 3 meters and the following settings. Adjust as needed. Make sure you don't let the car hit the CBR.
 - a) Report the final settings used in the program;
 - b) Make a photo or sketch of the setup;
 - c) Describe the car you were assigned;
 - d) Select off the data for Time (L_1) and Distance (L_2) to get the straight segment;
 - e) Give the Graph and Window of the selected data;
 - f) Provide the list L_1 , L_2 , L_3 (the Velocity);

MAIN MENU	▶START NOW
REALTIME:	NO
TIME(S):	3
DISPLAY:	DIST
BEGIN ON:	DELAY
SMOOTHING:	NONE
UNITS:	METERS

3. Modeling:
 - a) Which of the Six Models do you think you have from the graph of Time and Distance in problem #2?
 - b) Using either Bubble Baby or Regression - get the best equation to model the data.
 - c) Give the graph, showing the fit.
4. Calculate the Residuals for your model. Note: **Do not** modify the Velocity list L_3 .
 - a) Give the Lists that you create;
 - b) Report the Sum of the Squares of the Residuals;
 - c) Show the Scatter Plot of Time vs. Residuals, with the Window;
 - d) How well do you think your model fits the data collected from the car. Why?

5. Examine the Velocity list (L_3). Describe that you see in this data.
6. Setup a Scatter Plot of the Time vs. Velocity.
 - a) Give the Graph and Window.
 - b) What pattern do you see in the plot?
 - c) Give the equation that fits the pattern.
7. Verify your choice of pattern from problem # 5 or 6.
8. Give the scores needed by a student in Algebraic Connection to make a 77% for the Spring Semester. Verify that these scores would produce the desired grade.
9. Solve the following equations by Factoring (UN-FOILing). Verify your solutions using the Graphing Calculator. Document your solution and verification.

$$a) \quad 7x^2 - 343 = 0$$

$$b) \quad x^2 - 29x + 35 = 0$$

$$c) \quad x^2 = 10x - 25$$

$$d) \quad 169 = x^2$$

$$e) \quad 3x^2 - 55 = 28x$$

10. Why did you select the Web Page topic you did for the required AlgConn Portfolio? Which part of the page will be the most powerful? Why?
11. Compare your equation from PARAFUN with the equation below.

$$Angle = \frac{360^\circ}{Sides}$$

12. Use one of the equations from PARAFUN to test the images created for Half-Sides.
 - a) Report the TSTEP used for figures of the following sides:

$$3\frac{1}{2}; 4\frac{1}{2}; 5\frac{1}{2}; 6\frac{1}{2}; 7\frac{1}{2}$$

- b) What pattern do you see in Half-Side figures?
 - c) Give at least one graph that shows this pattern. Tell how it does.

13. Get the EXAM4 program and run it.
- Give the number you used at the start of the program;
 - Set up a Scatter Plot;
 - Get the Quadratic Bubble Baby in the form $A(x - H)^2 + K$;
 - Get the Regression equation in the form of $Ax^2 + Bx + C$;
 - Verify the values of **A**, **H**, and **K** using **A**, **B**, and **C**;
 - Calculate the Percent Error using the equation below, where **O** comes from part c and **M** comes from part d (all calculated in part e). Do this for **A**, **H**, and **K**;

$$\frac{|O - M|}{M} * 100\%$$

- Give the graph of the two equations with the Scatter Plot using Dueling Bubble Babies.

14. Why would one Purge their Portfolio and how would they do it?

15. Graphically explain the data below:

Where Your Tax Dollar Will Go: A rough breakdown of how each federal tax dollar will be spent in fiscal year 2001.

Who gets it	How much
Social Security	23¢
Health and Medical	21¢
National Defense	16¢
Income Security	14¢
Net Interest	11¢
Education, Training	4¢
Transportation	3¢
Veteran's Benefits and Services	3¢
Other	5¢